

## A NEW PINE TIP MOTH (OLETHREUTIDÆ) FROM THE GULF OF MEXICO REGION

by WILLIAM E. MILLER<sup>1</sup>

The pine tip moth treated in this paper has been recognized by taxonomists for more than 30 years as being different in some degree from related moths. During this time, specimens have been identified at the U. S. National Museum as an undescribed "variety" of *Rhyacionia rigidana* (Fernald). Although very similar to *R. rigidana*, the insect is specifically distinct. This southernmost occurring pine tip moth is herein described and named

### *RHYACIONIA SUBTROPICA* Miller, NEW SPECIES

#### *Description of Holotype*

Wingspan—18.5 mm. Labial palpus clothed with white scales, most of which have a light-brown medial transverse bar. Face with similar scales. Antennal base covered anteriorly and dorsally with white-tipped brown scales, elsewhere with silk-white scales. Head yellowish white. Collar composed of white-tipped brown scales. Dorsal aspect of thorax cream-colored anteriorly, dirty white posteriorly; ventral aspect silk-white. Anterior part of patagium clothed with brown-barred white scales; rest of patagium similar to dorsal aspect of thorax. Front and middle legs various shades of brown, banded with white. Femur of hind leg clothed with scales varying from dirty white to white with light-brown transverse bars; tibiae and tarsi, brown with white bands on outer side, white on inner side. Forewing costa brown, interrupted by 10 or 12 white patches. Apical 1/5 of forewing rusty brown, grading nearly to cream-colored toward radius. Brown terminal line and white subterminal line produced by brown-barred white scales. Several small groups of oversized lead- and silver-colored scales just inside termen; similar raised scales of lead, silver, and brown also present in other parts of wing, especially along margins of fasciæ. A narrow cream-colored fascia just proximal to apical area of forewing. The next proximal fascia deep rust in color, divided costally by white patches so as to resemble the letter "Y" (as in Fig. 1). Medial fascia cream-colored: the widest and most prominent of the fasciæ. The next proximal fascia rust and brown. Basal area of forewing cream-colored. Hindwing grayish brown with terminal and subterminal lines similar to those of forewing. Fringes of fore- and hindwings composed of scales of various shades of brown and of various lengths, many tipped with white. Abdomen not seen prior to clearing and mounting. (Abdominal coloration of other specimens of the hypodigm was a dirty, silk-white produced by silk-white scales, many of which had a faintly brownish medial transverse bar.)

The HOLOTYPE female (U. S. National Museum Catalog No. 65012) has label data as follows: "*Pinus*, Valparaiso, Fla., iss. 26 May 1927, E. W. Gemner, ♀ genitalia slide #3, C. H., 4-June-1935." The town of Valparaiso (type locality) is in Okaloosa County, Florida.

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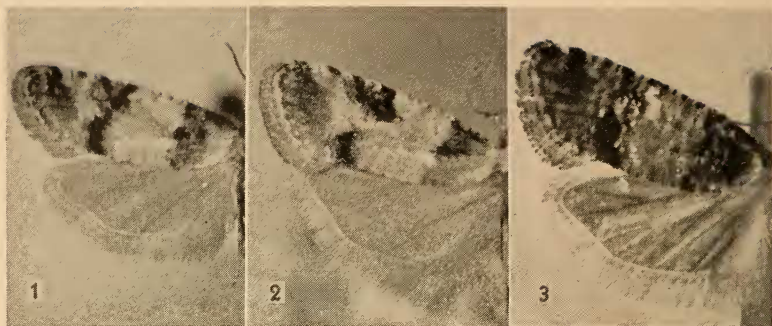


Fig. 1 - wings of a *Rhyacionia subtropica* adult from Florida; fig.2 - wings of a *R. subtropica* adult from Cuba; fig.3 - wings of a *R. rigidana* adult (North Carolina).

Three U. S. National Museum specimens with label data as follows are designated as PARATYPES: "E.E.A. Cuba Ento. No. 10521, Sto. Tomas, P. del Rio, May 10/35, S. C. Bruner, Boring shoots of *Pinus tropicalis*, ♀ genitalia slide #2, C. H., 4-June-1935"; same as Holotype, except "♀ genitalia slide 3.V.58, W.E. Miller"; ♂ same as Holotype except "Issued 14.7.27".

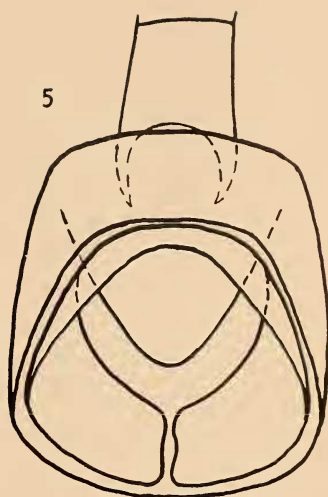
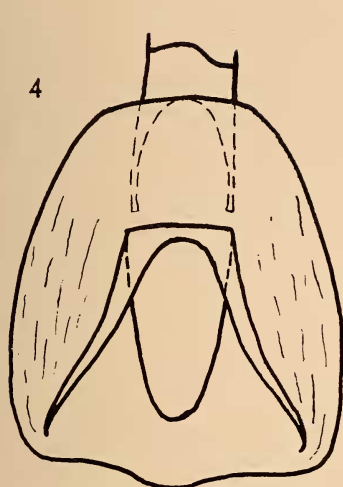
#### VARIATION

In all, 83 adult specimens of *Rhyacionia subtropica* were examined in this study. Nineteen of them (the ones in best condition) from nine localities were compared with the Holotype to ascertain extent of color variation. Only minor variations were found: The patagium varied in the proportion of cream-colored scales to brown-barred and dirty white scales clothing it. Also, an occasional thorax was more dirty white in appearance than cream-colored. Finally, the "Y" marking on the forewing of the four Cuban specimens seen was broken in the middle in contrast to that of mainland specimens (Figs. 1 and 2).

Curiously, the males exhibited polymorphism in genital structure. There were three sorts of genitalia based on differently shaped valvæ: Some males had valvæ both of which were like that in Fig. 6; some had both like that in Fig.7; and some had one of each. Similar polymorphism was found among *R. rigidana* males, and all three valval combinations were about equally represented in both species (nine slide mounts of *R. subtropica* male genitalia seen and eight of *R. rigidana*).

#### DIFFERENTIATION

As hinted earlier, *R. subtropica* most nearly resembles *R. rigidana* (Fernald). It differs from *R. rigidana* most importantly in female genital structure, but also in forewing coloration and possibly size. In female genitalia, the ostium bursæ of *R. subtropica* consists of but one fused part (21 slide



Ostium bursæ of *R. subtropica* (fig.4) and *R. rigidana* (fig.5); figs.6 & 7 - valvæ of *R. subtropica* (those of *R. rigidana* are indistinguishable).

mounts seen) while that of *R. rigidana* consists of two parts (11 slide mounts seen), and there are other lesser differences (Figs. 4 and 5). No diagnostic differences in male genitalia were found. Whereas cream-colored scales entirely or almost entirely comprise the medial fascia of the *R. subtropica* forewing, such scales comprise not more than half of the medial fascia of the *R. rigidana* forewing, which has white scales, grayish-brown scales, and white-tipped grayish-brown scales besides. Also, the base of the *R. subtropica* forewing is cream-colored, unlike that of *R. rigidana* (Figs. 1-3).

Wingspan comparisons suggest that *R. subtropica* may be a slightly smaller insect than *R. rigidana*. The wingspans of all spread *R. subtropica* specimens were measured. Twenty-seven males and 31 females had wingspan averaging  $14.7 \pm 0.4$  mm. ( $\pm$  indicates estimate of standard error of the mean) and  $16.5 \pm 0.3$  mm., respectively. The mean difference of 1.8 mm. between male and female wingspans is statistically significant at the .01 level ( $t = 3.7$ ). The wingspans of 21 *R. rigidana* males from 8 states and of 27 *R. rigidana* females from 11 states averaged  $15.4 \pm 0.3$  mm. and  $16.9 \pm 0.2$  mm., respectively. The mean difference of 1.5 mm. between *R. rigidana* male and female wingspans is also significant at the .01 level ( $t = 4.5$ ). The wingspans of *R. subtropica* males and females averaged 0.7 and 0.4 mm. smaller, respectively, than those of *R. rigidana* males and females. This species size difference was tested for significance by the analysis of variance. The F-value was 3.51 with 1 and 102 degrees of freedom. Since the probability of F being this large even though the two species do not differ is between .10 and .05, the difference is not quite significant. A still larger sample will be needed to arrive at a more definite conclusion. This analysis also showed that *R. subtropica* is more variable in size than *R. rigidana*, significant at the .01 level. The variance of the *R. subtropica* male wingspans was 3.55 mm. and that of the female wingspans was 2.99 in contrast to 1.43 and 1.16 respectively of male and female *R. rigidana* wingspans.

#### GEOGRAPHIC DISTRIBUTION AND HOSTS

The known geographic distribution of *R. subtropica* is Pinar del Rio Province (Cuba) north to South Carolina and west along the U. S. Gulf coast to Mississippi (Fig.8). Eleven species and varieties of pines occur in this area (Little, 1953; Little & Dorman, 1954), and four of these were listed on host labels of pinned adults examined in this study. They are Slash Pine, *Pinus elliottii* var. *elliottii* Engelm. (specimens from Florida and Georgia); Loblolly Pine, *P. taeda* L. (Florida); Longleaf Pine, *P. palustris* Mill. (given only by common name) (Florida and South Carolina); and Tropical Pine, *P. tropicalis* Morelet (Pinar del Rio). The range of *P. elliottii* varieties (Little & Dorman, 1954) coincides closely with the known distribution of *R. subtropica*. The insect possibly occurs over a wider range in the U. S., the West Indies, and perhaps also in Central America where pines grow. The writer recommends "Subtropical Pine Tip Moth" as a common name for the insect.

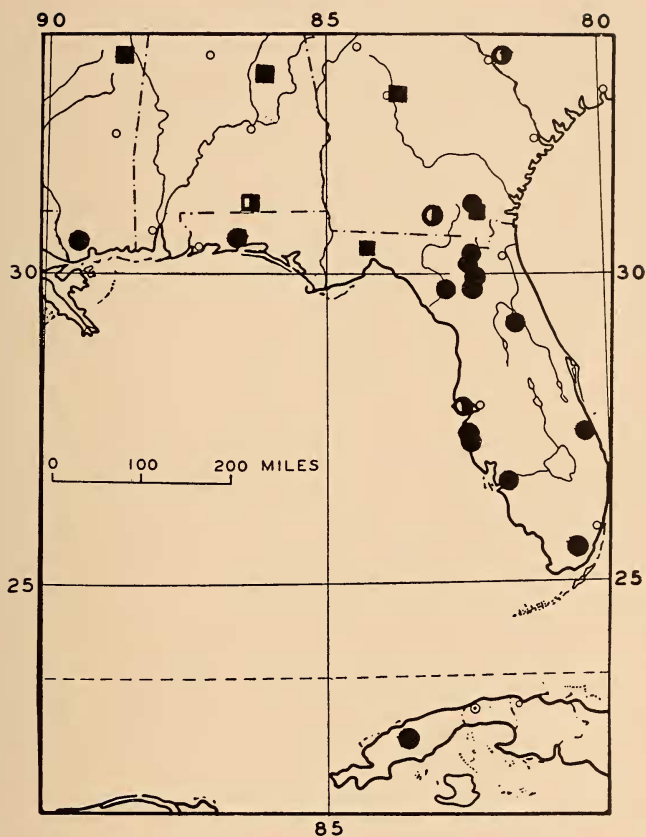


Fig.8 - Distribution of *R. subtropica* records (circles) and nearest *R. rigidana* records (squares). The solid and partially blackened points represent identifications based on female genitalia and male specimens, respectively.

### HABITS

*Rhyacionia subtropica* is similar in its ecology to *R. rigidana* and *R. frustrana* (Comstock). The larvæ feed in the tips and current year's shoots of the trees, and pupation takes place in the larval tunnels. Emergence or capture-dates on the labels of 62 pinned adults from 19 localities indicated at least 2 separate moth flight periods as follows: December 7 to March 6 and May 1 to August 5. These periods suggest that one generation develops in late summer and another in the spring.

### REMARKS

The range of *R. rigidana* overlaps somewhat with the range of *R. subtropica* (Fig.8) and so does that of *R. frustrana*. *R. rigidana* and *R. frustrana* have been confused at times in the past by fieldworkers (Miller &



Neiswander, 1959), and no way to differentiate larvæ of these two species is yet known (MacKay, 1959). *R. subtropica* further complicates the tip moth field recognition problem in the area where all three tip moths occur. The writer has reared *R. subtropica* and *R. frustrana* from the same tree in Mississippi. In another case, two tip moth adults, referred to the writer for identification and said to have been reared from the same tip in South Carolina, proved to be *R. subtropica* and *R. frustrana*.

WAKELEY (1954) noted that a tip moth, after causing damage in Lanier Co., Ga., had been identified in 1929 as *R. rigidana*; very likely it was actually *R. subtropica*. A *R. subtropica* specimen in the U. S. National Museum, collected by WAKELEY in 1929 from Stockton (Lanier Co.), Ga., was found during this study to have been incorrectly identified as *R. rigidana*.

*Rhyacionia subtropica* was also involved at least partly in the "*R. rigidana*" infestation at Waycross, Ga., briefly described by BEAL, *et al.* (1952). A *R. subtropica* specimen in the U. S. National Museum bearing a label with a 4-digit number was traced, with records on file at the Duke University School of Forestry, to Waycross and to the year and observer mentioned by BEAL *et al.* *R. subtropica* is the unnamed species which was distinguished from *R. rigidana* by MILLER and NEISWANDER (1959).

#### ACKNOWLEDGEMENTS

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